



智能电网的技术组成和实现顺序

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提要: 概述了现代电网的目标、特征、主要技术组成和实现顺序等问题。智能电网研究的4大目标是: 实现电网安全稳定运行; 使分布式电源得到有效的利用; 提高电网资产的利用率; 提高用户用电的效率、可靠性和电能质量。在技术上智能电网通过高级量测体系(AMI)、高级配电运行(ADO)、高级输电运行(ATO)和高级资产管理(AAM)之间的密切配合实现上述目标。发展智能电网的顺序会影响成本和效益, 一般情况下 AMI 是电网智能化的第一步, 在对电能质量要求高的地方可以试点ADO。灵活的可重构的配电网拓扑和集成的能量与通信系统IECSA是未来智能电网的基础, 所以城市电网规划阶段需要有长远考虑。

关键词: 智能电网; 高级量测体系; 高级配电运行; 高级输电运行; 高级资产管理

Technical Composition of Smart Grid and its Implementation Sequence

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Abstract: The objectives, features, main technical composition of the modern power grid and its implementation sequence are briefly discussed. The four major objectives of smart-grid development are to achieve safe and stable operation of power grid, to enable distributed generation with great efficiency, to improve the utilization of the grid's assets, and to provide power for consumers with higher efficiency, reliability and quality. These objectives can technically reach through the smart grid with close cooperation of the AMI, ADO, ATO and AAM. The costs and benefits of smart-grid development are depending on its implementation sequence, and thus the first step of smart-grid development is generally AMI while ADO is proposed to test in areas of high power quality requirement. It is suggested that even at the planning stage of a urban power grid, its long-term development should be taken into account as the flexible and reconfigurable distribution-network topology and the integrated energy and communication system architecture (IECSA) are the foundation of any smart-grid.

Key words: smart-grid; advanced metering infrastructure; advanced distribution operation; advanced transmission operation; advanced asset management

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